

Faculty Executive Committee Approved Regulations and Policies Outlining the Technical Breadth Requirement

Technical Breadth Areas (as of 7/7/09) It should be noted that courses in a Technical Breadth area cannot be used to satisfy *other requirements in a student's major. Students must satisfy a TBA outside their major's department. As part of the TBA, a student may choose to take one cross-listed course that is cross-listed between the student's department and other departments as long as that cross-listed course is approved for the TBA AND the student is not using the cross-listed course to satisfy other requirements in the student's major. SEE PAGE 2 OF THIS DOCUMENT FOR A SUMMARY OF THE RESTRICTIONS.

The Technical Breadth area in Bioengineering is designed to provide students with the opportunity to gain working knowledge of a technical field other than his/her major. SEE PAGE 2 OF THIS DOCUMENT FOR A SUMMARY OF THE RESTRICTIONS.

Required Upper Division Courses (12 units): At least three courses (12 units) selected from Bioengineering 100 through 187. One of the three courses can be substituted by Chemistry and Biochemistry 20B or by Life Science 3 if not used to satisfy other requirements in a student's major.

The Technical Breadth area in Chemical and Biomolecular Engineering is designed to provide students with the opportunity to gain working knowledge of a technical field other than his/her major. SEE PAGE 2 OF THIS DOCUMENT FOR A SUMMARY OF THE RESTRICTIONS.

Required Upper Division Courses (12 units): At least three courses (12 units) selected from Chemical and Biomolecular Engineering 100 through 187. CH ENGR 102A is not open to students with MECH AE 105A credit. One of the three courses can be substituted by Chemistry and Biochemistry 20B if not used to satisfy other requirements in a student's major.

The Technical Breadth area in Civil and Environmental Engineering is designed to provide students with the opportunity to gain working knowledge of a technical field other than his/her major. SEE PAGE 2 OF THIS DOCUMENT FOR A SUMMARY OF THE RESTRICTIONS.

Required Upper Division Courses (12 units): At least three courses (12 units) selected from Civil and Environmental Engineering 100 through 187. One of the three courses can be substituted by Chemistry and Biochemistry 20B if not used to satisfy other requirements in a student's major. C&EE 101 not open to students with MECH&AE 101 credit, C&EE108 not open to students with MECH&AE 102 credit, C&EE 103 is not open to students for whom EL ENGR 103 credit.

The Technical Breadth area in Computer Science is designed to provide students with the opportunity to gain working knowledge of a technical field other than his/her major. SEE PAGE 2 OF THIS DOCUMENT FOR A SUMMARY OF THE RESTRICTIONS.

Required Upper Division Courses (12 units): At least three courses (12 units) selected from Computer Science 100 through 187. One of the three courses can be substituted by Computer Science 32 or 33 if not used to satisfy other requirements in a student's major.

The Technical Breadth area in Electrical Engineering is designed to provide students with the opportunity to gain working knowledge of a technical field other than his/her major. SEE PAGE 2 OF THIS DOCUMENT FOR A SUMMARY OF THE RESTRICTIONS.

Required Upper Division Courses (12 units): At least three courses (12 units) selected from Electrical Engineering 100 through 187. -EL ENGR 103 is not open to students with C&EE 103 credit.

The Technical Breadth area in Materials Science and Engineering is designed to provide students with the opportunity to gain working knowledge of a technical field other than his/her major. SEE PAGE 2 OF THIS DOCUMENT FOR A SUMMARY OF THE RESTRICTIONS.

Required Upper Division Courses (12 units): At least three courses (12 units) selected from Materials Science and Engineering 100 through 187. One of the three courses can be substituted by Chemistry and Biochemistry 20B if not used to satisfy other requirements in a student's major.

The Technical Breadth area in Mechanical and Aerospace Engineering is designed to provide students with the opportunity to gain working knowledge of a technical field other than his/her major. SEE PAGE 2 OF THIS DOCUMENT FOR A SUMMARY OF THE RESTRICTIONS.

Required Upper Division Courses (12 units): At least three courses (12 units) selected from Mechanical and Aerospace Engineering 100 through 187. MECH&AE 101 not open to students with C&EE 101 or C&EE 108 credit, MECH&AE 102 not open to students with C&EE 101 credit, MECH&AE 105A is not open to students with CH ENGR 102A credit, MECH&AE 105D is not open to students with CH ENGR 101B credit.

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The Technical Breadth area in Nanotechnology is designed to train students with the cutting-edge knowledge and skills for their future successes in nanorelated fields. [SEE BOTTOM OF THIS PAGE FOR A SUMMARY OF THE RESTRICTIONS.](#)

Required Upper Division Courses (12 units): ENGR M101/MAT SCI M105 (required), additional 8 units selected from ENGR 103, EL ENGR 128 (EL ENGR major students may take this course as long as they are NOT using the course to satisfy another major requirement, course not planned to be offered until 2008-09), MECH&AE C187L.

The Technical Breadth area in Technology Management is designed to teach students how technology management works and what drives decision making in start-ups, in venture-backed IPOs and in giant multinationals [SEE BOTTOM OF THIS PAGE FOR A SUMMARY OF THE RESTRICTIONS.](#)

Required Courses (12 units): selected from ENGR 110, ENGR 111, ENGR 112, ENGR 113, ENGR 180.

The Technical Breadth area in Engineering Science is designed to provide students with the opportunity to gain working knowledge of a technical field other than his/her major. [SEE BOTTOM OF THIS PAGE FOR A SUMMARY OF THE RESTRICTIONS.](#)

Required Courses (12 units): At least three courses (12 units) selected from BIOMED C101, COM SCI 32, CH ENGR 102A (not open to students with MECH&AE 105A credit), C&EE 101 (not open to students with MECH&AE 101 credit), C&EE108 (not open to students with MECH&AE 101 credit), EL ENGR 100, EL ENGR 101, ENGR M101/MAT SCI M105, EL ENGR 102, EL ENGR103 (not open for students with C&EE 103 credit), MAT SCI 104, MECH&AE 101 (not open to students with C&EE 101 credit), MECH&AE 102 (not open to students with C&EE 101 credit), MECH&AE 103, MECH&AE 105A (not open to students with CH ENGR 102 credit), MECH&AE 105D (not open to students with CH ENGR 101B credit). However, the selected courses must be from outside the student's major, except that MECH&AE 105D is acceptable for AE majors.

The Technical Breadth area in Engineering Mathematics is designed to provide students with the opportunity to gain working knowledge of a technical field other than his/her major. [SEE BOTTOM OF THIS PAGE FOR A SUMMARY OF THE RESTRICTIONS.](#)

Required Courses (12 units): At least three courses (12 units) selected from C&EE 110, COM SCI 112, COM SCI 170A, COM SCI 180, COM SCI 181, EL ENGR 102, EL ENGR 103 (not open for students with C&EE 103 credit), EL ENGR 131A, MECH&AE 181A, MECH&AE 182A, MECH&AE 182B, MECH&AE 182C, MATH 132, STATS 105. However, the selected courses must be from outside the student's major, except that MECH&AE 182B and MECH&AE 182C are acceptable for ME and AE majors.

SUMMARY OF RESTRICTIONS

Item 1: The following lists several subsets of courses. It is not permitted to use more than one course from the same subset in meeting the degree requirements of any HSSEAS major unless an additional course from that subset is explicitly specified as recommended or is listed as a prerequisite in the catalog description of the course in the same subset.

Item 2: A student who is taking a curriculum that requires a subset of courses from another department (different from the one from which the student's degree is granted) may select three additional upper division courses for a TBA from that department to broaden his/her education in that area of study, as long as item 1 is satisfied.

Subset 1: Probability and Statistics course subset (C&EE 110, STATS 110A, EL ENGR 131A, MATH 170A, STATS 100A, MECH&AE 174)

Subset 2: Numerical Computing course subset (EL ENGR 103, C&EE 103, CH ENGR 109, MECH&AE 182C)

Subset 3a): Structural Mechanics Subset (C&EE 108, MECH&AE 101 and C&EE 130)

Subset 3b): Statics and Dynamics Subset (C&EE 101, MECH&AE 101, and MECH&AE 102)

Subset 4: Networking Subset (EL ENGR 132B, COM SCI 118)

Subset 5a: Introductory Thermodynamics subset (CH ENGR 102A, MECH&AE 105A)

Subset 5b: Transport Phenomena (CH ENGR 101B, MECH&AE 105D)

Subset 6a: Systems (EL ENGR 102, MECH&AE 107)

Subset 6b: Controls (CH ENGR 107, EL ENGR 141, MECH&AE 171A)

*Aerospace Engineering and Mechanical Engineering majors should refer to the [HSSEAS Announcement for clarification on their options.](#)